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AIR QUALITY ASSESSMENT
THUNDER BAY TERMINALS LIMITED
THUNDER BAY, 1987

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Minister

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RÉSUMÉ

Dupuis 1978, la société Thunder Bay Terminals Limited exploite des installations de stockage en vrac et de transbordement près du port de Thunder Bay. Les enquêtes sur la qualité de l'air qui y ont été effectuées (prélèvements d'air et échantillonnages de la végétation, du sol et de la neige) ont révélé que la concentration de poussières n'avait pas augmenté dans les environs depuis le début des activités. En 1987, la société a transbordé ou stocké plus de quatre millions de tonnes de charbon et environ un million de tonnes de potasse et de produits agricoles.

En 1987, la concentration moyenne de poussières, c'est-à-dire les retombées de poussières et l'ensemble des particules en suspension, était toujours acceptable. On continue toutefois de surveiller la qualité de l'air afin de s'assurer que les objectifs provinciaux sont respectés.

INTRODUCTION

Since 1978, Thunder Bay Terminals Limited has operated a bulk storage and trans-shipment facility adjacent to Thunder Bay harbour. Air assessment studies (including air quality monitoring, vegetation, soil and snow sampling) have shown that there has been no increase in dust levels off company property as a result of operations at the terminal. In 1987, the terminal processed over 4 million tonnes of coal, and about 1 million tonnes of potash and agricultural products.

AIR QUALITY DATA FOR 1987

DUSTFALL

In 1987, monthly dustfall was measured at the six sites shown in Figure 1. Thunder Bay Terminals provided data for sites 1, 3, 6 and 7. Sites 9 and 10 are part of the Ministry's monitoring network.

The 1987 dustfall results (Table 1) show that at locations off company property (sites 1, 9, and 10), monthly dustfall never exceeded Ontario's maximum acceptable limit of 7 $g/m^2/30$ d (grams of total dustfall per square metre during 30 days). The annual dustfall objective (4.6 $g/m^2/30$ d) was also met at all three off-property sites. At the three monitoring locations on Thunder Bay Terminals property, there were only two exceedences of the monthly objective (November and December, site 6). Dustfall at site 6 was slightly above the annual limit while the other two on-property sites met the objective.

Average dustfall at the six monitoring sites in 1987 was the second lowest recorded since monitoring began in 1976 (Table 2). There was no trend in dustfall levels from 1980 to 1987.

TOTAL SUSPENDED PARTICULATE MATTER (TSP)

Suspended particulate matter (TSP) comprises particles of small size which remain entrained in the air for long periods. TSP at three locations was measured for a 24-hour period every sixth day during 1987, using a standard high-volume sampler. Table 3 shows that during the year, TSP met the annual objective (60 $\mu g/m^3$) at all monitoring sites. There were only two exceedences of the daily objective (120 $\mu g/m^3$) on company property (site 3), and no exceedences off-property. Average TSP at the three sites (Table 4) was similar to values recorded for many of the 11 preceding years; TSP levels showed no trend from 1976 to 1987.

CONCLUSION

Average dust levels, measured as dustfall and total suspended particulate matter, continued to be recorded at acceptable concentrations around Thunder Bay Terminals in 1987. Monitoring is being continued to ensure compliance with provincial air quality objectives.

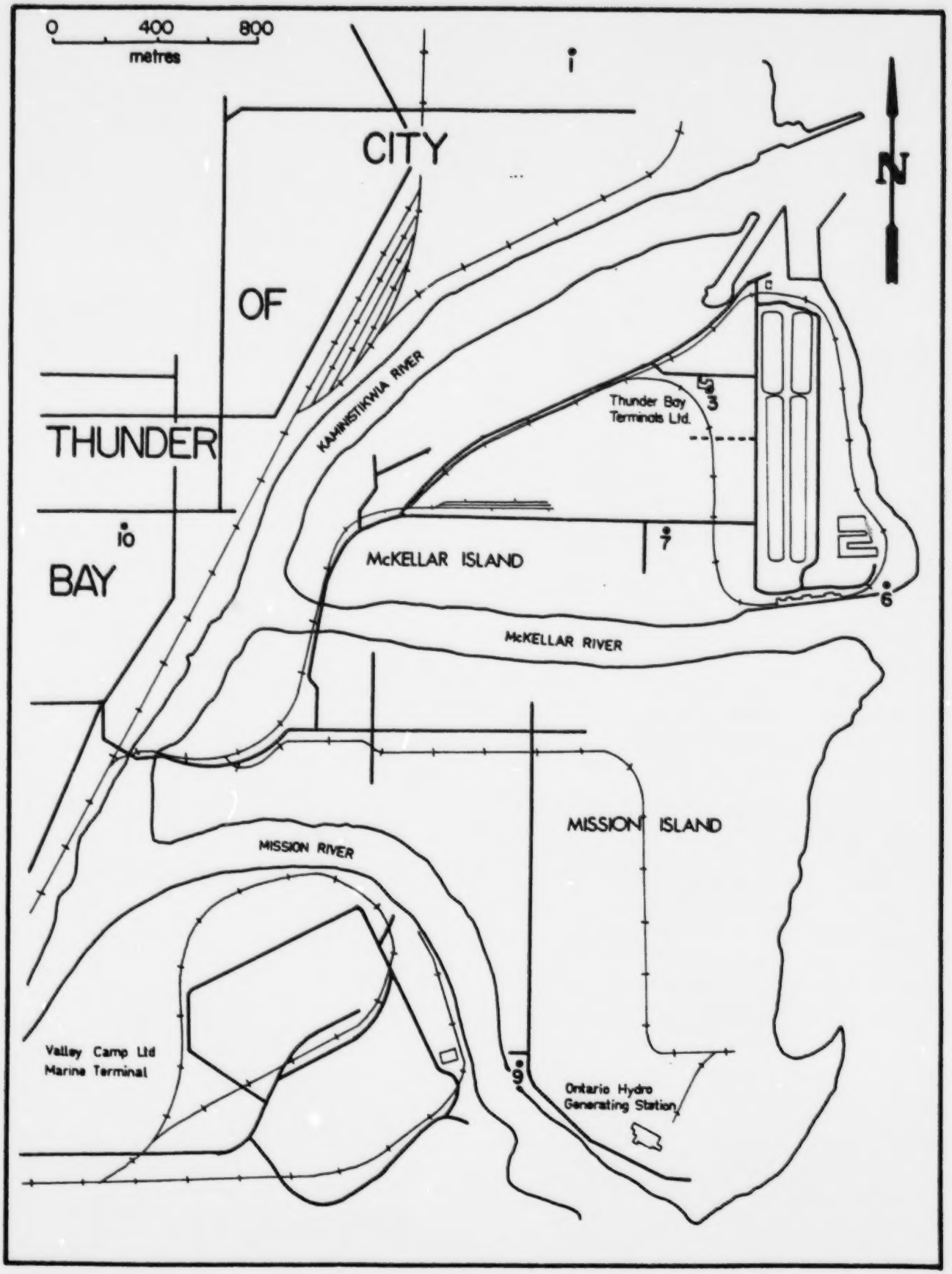

Figure I. Air quality monitoring sites, Thunder Bay Terminals, 1987.

TABLE 1. Total dustfall ($g/m^2/30$ days) near Thunder Bay Terminals Limited, 1987.

Site	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1	Sewage Treatment Plant	0.8	3.7	0.7	4.0	2.5	4.0	4.5	3.0	2.2	2.0	2.6	2.7	2.7
3[a]	Thunder Bay Terminals	1.6	3.8	2.3	7.0	4.7	3.4	5.1	6.1	4.3	1.0	5.1	2.3	3.9
6[a]	Thunder Bay Terminals	3.4	3.5	0.4	8.2	3.0	4.3	6.0	5.5	4.5	1.2	<u>13.1</u>	<u>8.2</u>	<u>5.1</u>
7[a]	Thunder Bay Terminals	0.5	2.2	1.8	4.6	3.2	4.7	5.2	5.1	4.3	0.8	3.4	2.2	3.2
9	Kam Boating Club	0.6	0.9	0.9	1.7	3.0	2.4	2.3	2.0	1.0	0.5	0.2	0.7	1.4
10	McKellar Hospital	1.4	1.8	3.7	5.7	5.6	3.9	2.7	2.3	2.6	1.9	1.1	1.8	2.9

[a] Sites on company property.
[b] Values exceeding maximum acceptable levels of 7.0 (monthly) or 4.6 (annual mean) are underlined.

TABLE 2. Average annual dustfall ($g/m^2/30$ d) near Thunder Bay Terminals Limited, 1976-1987.

Monitoring site	Location	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
1	Sewage Treatment Plant	3.2	4.4	3.2	2.8	2.5	2.1	2.8	3.4	3.6	6.1[a]	1.8	2.7
3[a]	Thunder Bay Terminals	4.2	4.2	2.7	2.7	5.2	3.6	4.7	8.2	5.0	8.1	3.6	3.9
6[a]	Thunder Bay Terminals					8.5	6.9	8.8	19.5	15.3	15.7	3.5	5.1
7[a]	Thunder Bay Terminals					7.9	4.3	3.2	16.1	4.0	7.2	2.3	3.2
9	Kam Boating Club	5.6	4.6	4.3	4.2	2.5	2.1	3.4	1.7	2.1	1.9	1.7	1.4
10	McKellar Hospital	3.5	5.0	3.8	3.8	4.0	3.7	3.8	3.1	3.4	3.9	2.8	2.9
	Averages					5.1	3.8	4.4	8.7	5.6	7.2	2.6	3.2

[a] Sites on company property.
[b] Values above maximum acceptable level of 4.6 are underlined.

TABLE 3. Concentrations of total suspended particulate matter ($\mu g/m^3$) near Thunder Bay Terminals Limited, 1987.

Date	Monitoring sites[a] 1	3[b]	10	Date	Monitoring sites[a] 1	3[b]	10
Jan 3	63	65	55	Jul 2	36	61	45
9	10	14	31	8	42	67	37
15	27	28	43	14	47	90	27
21	37	49	29	20	36	50	-
27	34	48	22	26	34	68	26
Feb 2	9	22	17	Aug 1	39	49	26
8	16	44	39	7	52	92	36
14	15	31	16	13	15	27	34
20	24	53	-	19	28	27	25
26	9	18	87	25	16	14	24
				31	15	21	21
Mar 4	15	26	37				
10	75	99	67	Sep 6	30	54	-
16	37	84	63	12	28	27	30
22	20	45	53	18	15	41	43
28	17	22	24	24	36	31	31
				30	28	29	22
Apr 3	60	118	64				
9	98	244	87	Oct 6	12	31	14
15	37	50	59	12	19	26	46
21	49	86	47	18	17	20	26
27	41	64	44	24	14	22	23
				30	39	62	35
May 2	45	90	43				
8	100	119	79	Nov 5	26	22	16
14	26	77	54	11	60	104	56
20	24	36	34	17	18	47	-
26	39	52	69	23	44	54	28
				29	12	11	8
Jun 2	59	77	57				
8	41	88	32	Dec 5	47	45	48
14	36	61	41	11	38	44	31
20	77	126	78	17	62	70	60
26	25	36	28	23	26	48	17
				29	31	38	45
				Annual Mean:	30	46	36

[a] See Figure 1.
[b] Site on company property.
[c] Values above the 24-hour objective (120 $\mu g/m^3$) are underlined.

TABLE 4. Annual geometric means ($\mu g/m^3$) of total suspended particulate matter near Thunder Bay Terminals Limited, 1976-1987.

Monitoring site	Location	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
1	Sewage Treatment Plant	41	31	27	30	28	31	28	27	38	28	34	30
3	Thunder Bay Terminals	47	33	34	33	33	39	32	42	59	37	49	46
10	McKellar Hospital	49	36	44	51	44	52	39	36	44	36	40	36

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